

Paint, exterior wood primer	Fed Spec TT-P-25c
Paint, exterior wood & metal finish	Fed Spec TT-P-105a
Paint, interior masonry, concrete and gypsum wallboard	Fed Spec TT-P-29g
Paint, interior wood & metal trim and doors	Fed Spec TT-E-543 (1st coat) & Fed Spec TT-E-508 (2nd coat)
Welded steel wire	ASTM A 185-64
Masonry units	ASTM C 90-66T
Mortar	ASTM C 270-64T
Joint reinforcing	Fed Spec QQ-W-461
Toggle bolts and expansion sleeve	Fed Spec FF-B-588b
Nails, wire, brads & staples	Fed Spec FF-N-105a
Builders' hardware, shelf & misc.	Fed Spec FF-H-00111b
Expansion shield	Fed Spec FF-S-325
Insulation	Fed Spec HH-I-521c
Hardwood veneer doors (solid & hollow core)	CS 171-58 (reprint July 1964 with amendments)
Exterior wood trim	C-grade or better southern yellow pine or Douglas fir
Wood framing	No. 2 southern yellow pine or better (or other species providing they equal the grade and stresses of pine)
Interior wood trim	B-grade or better southern yellow pine or Douglas fir
Roofing felt	ASTM D 226-60
Waterproofing felt	ASTM D 227-56
Roofing asphalt	ASTM D 312-64
Waterproofing pitch	ASTM D 450-41
Roofing aggregate	ASTM D 1863-64
Exterior calking, gun type, polysulphide sealant	Standard product common to industry
Gypsum wallboard	Fed Spec SS-L-30c
Acoustical ceiling units	Fed Spec SS-S-118, class 25
Builders' hardware, locks & door trim	Fed Spec FF-H-106a
Builders' hardware, hinges	Fed Spec FF-H-116c
Builders' hardware, door closer	Fed Spec FF-H-121c

7. EARTHWORK: Earthwork shall consist of excavating, backfilling and/or filling, grading and removal of concrete walks and patio stones within the limits for the building addition shown on drawings. Final grading shall be

done in such manner that the area immediately around the building addition will continually and effectively drain by gravity. When excavating, care shall be taken to locate and protect underground utilities that may be existing. Failure to do so shall cause the Contractor to be liable, resulting in repairs or replacements at his expense.

8. CONCRETE: Concrete shall be ready mixed 2,500 psi compressive strength for footing, floor slab and walks, and 3,000 psi compressive strength for the beam. A certificate of compliance shall be furnished by the supplier. Concrete protection over steel reinforcement shall be 3 inches for footing, 1-1/2 inches for beam and 3/4 inch for floor slab. Concrete forming shall be of the type, size and bracing to properly and adequately retain the concrete and to obtain the kind of finish required. Beam forms may be stripped after concrete has set a minimum of 24 hours. All anchorage items such as bolts, dowels, etc., shall be installed where/as shown on drawings sufficiently to insure sound anchorage for the purpose intended. Concrete shall be vibrated and/or tamped after placing to produce satisfactory consolidation, without causing objectionable segregation. Upon form removal from beam any slight honeycomb and minor defects shall be patched with a 1:2 grout mix, and the beam sides shall be rubbed and floated with a sand cement wash to remove burrs and blemishes, producing a smooth finish. Floor slab, walks and beam shall be cured for a minimum period of 5 days. Curing may be done by using sand, burlap, waterproof paper, liquid curing compound, or a combination of these methods, providing the concrete sustains adequate moisture retention over the curing period. Walks and floor slab shall be screeded and floated, with the final finish producing a wood float or broomed finish for walks and a smooth steel trowel finish for the floor slab.

9. MASONRY: Masonry work shall be done as shown on drawings and shall be laid plumb, true to line, and uniform in joints with each course breaking joints with the next course below except where jamb blocks may necessitate stacking each course. Joints shall align with existing where feasible. Horizontal joint reinforcing, 1/4 inch rods or "Durawall," shall be provided in alternate courses, and vertical blockwork abutting existing masonry walls shall be keyed for anchorage by imbedding steel dowel rods into the existing masonry as indicated on drawings. All jamb block cells (including block cells at new/existing masonry wall tie-ins) shall be filled with mortar or grout. Mortar shall be a 1:3 proportionate mix. Vertical joint of new/existing masonry connection shall be raked out and filled therein with polysulphide caulking as shown on drawings. Masonry units requiring cutting shall be cut with a masonry saw only, hammer chipping will not be allowed.

10. ROUGH CARPENTRY: Rough carpentry work, including stud partitions, rafters, nailers, ledgers, furring and blocking, shall be installed where/as shown on drawings. Any additional framing, not shown on drawings, that may be required due to existing conditions shall be done as necessary to achieve a structurally sound job. Any deviations or changes that may be required in framing methods shown on drawings due to existing conditions may also be done, but not until approval has been obtained from the Contracting Officer. All framing shall be closely fitted, accurately set to required lines and levels,

and rigidly secured in place. Stud wall framing shall be done as shown on drawings with the sole plates anchored to concrete floor using 1/2 inch expansion bolts or powder driven threaded studs. Sole plates shall be anchored at each end of each piece and at intermediate intervals not greater than 4 feet. Studs shall be doubled at openings, and headers for openings shall be made of two pieces of stud material set on edge. Stud corners shall be constructed of not less than three full members. End studs abutting masonry shall be anchored thereto with three 1/2 inch expansion bolts or toggle bolts, as required. Furring attached to masonry shall be nailed at 16-inch centers using case hardened nails. Nailers and ledgers for supporting rafters shall be attached as shown on drawings and shall be uniformly sloped from the high point downward at a rate not less than 1/8 inch per foot to attain roof pitch and for setting rafters. Rafters shall be notched to set on ledgers and toenailed with not less than 8d penny common nails top and bottom, 2 nails each into ledger and nailer. Rafters shall be cut to fit close and installed in the dry. The Contractor shall at no time allow rafters to become wet from rain, for the purpose of preventing swelling and expansion of the wood rafters which could cause possible lateral thrust inward of the existing westerly masonry wall. Polyethylene or other covering shall be available on the job site for this protection. One row of solid blocking shall be installed between the rafters at mid-point of the span. All framing lumber shall bear a grade mark and shall conform to the specifications described hereinbefore and other requirements shown or specified. All nails shall be galvanized.

11. FINISH CARPENTRY: Finish carpentry work, including interior base, shoe, casings, ceiling trim and exterior frieze, fascia, soffit, trim and closures shall be installed where/as shown on drawings. Any additional exterior finish work, not shown on drawings, that may be required due to existing conditions shall be done as necessary to achieve an overall finished job. Any deviations or changes that may be required in exterior finishing methods shown on drawings due to existing conditions may also be done, but not until approval has been obtained from the Contracting Officer. Exposed exterior finish woodwork shall be pressure preservative treated. All finish woodwork shall be smooth, sanded and ready to receive painting. Nailing shall be blind where possible, countersunk for putty stopping. All nails for exterior finish work shall be galvanized. Wood trim shall be in as long lengths as practicable. Joints shall be staggered, concealed, or placed in unobjectionable locations, and shall be tightly fitted. All interior trim shall match existing. Molding trim shall be mitered at exterior corners and coped at interior angles. All joints in exterior trim work shall be sealed with white lead paste.

12. DOORS AND DOOR FRAMES: New door frames shall be constructed as shown on drawings and to match existing. Frames shall be set plumb and square, double wedged, and secured with finishing nails. Frames in exterior masonry shall be rabbited from the solid. All frames in masonry shall be anchored with 3 toggle or expansion bolts per jamb. New doors shall be as specified hereinbefore and indicated on the drawings, and shall have 1/16 inch clearance

at sides and top, and 3/8 inch at bottom except doors with weatherproof thresholds which shall be cut on a 1/8 inch bevel and closely fitted to the threshold. Lock edge of doors shall be beveled 1/8 inch. Locks shall be installed 38 inches above finished floor. Doors shall receive 1-1/2-pair door butts. Doors to receive bottom louvers shall have louvers 12 x 12 inches and of the type to match existing. Weatherstripping for exterior doors shall be spring bronze or aluminum, and shall completely weatherstrip the doors. Doors and door frames including hardware, to be relocated, shall be removed and reinstalled to match the original installation.

13. FINISH HARDWARE: Finish hardware for new doors shall be to match existing and/or as follows:

13.1 New doors for additive alternate (WN-16):

Aluminum weatherstrip threshold
1-1/2 pr. butts T2107, USP, NRP
Lockset 86B-5S, US28
Closer 3001 P, sprayed aluminum finish spring bronze or
aluminum weatherstripping
(Note: Above hardware set is for one door. Locksets shall be
keyed alike.)

13.2 New doors for base bid (WN-7, WN-8, WN-10):

1-1/2 pr. butts 2127, USP
Lockset 160R-4, US28
Door stop 1323AL
(Note: Above hardware set is for one door.)

14. VINYL ASBESTOS TILE: Concrete floor shall be cleaned free of oil, grit, moisture or other defects that would adversely affect bonding of the new tile flooring. Floor cement and tile shall be applied in strict accordance with the manufacturer's instructions and specifications. Tile shall be laid so that the entire undersurface will be securely bonded in place and be tightly fitted so that each tile is in contact with the surrounding tiles and all joints are in proper alinement. Colors shall be as selected by the Contracting Officer. Laying pattern of tile shall match existing. Upon completion of the installation the tile shall be thoroughly cleaned of all cement spots, dirt, and other soiling, and shall be left in a condition acceptable to the Contracting Officer. Existing tile shall be repaired and new units provided, to match existing, as required due to relocation of partition or other work accomplished under this contract.

15. ACOUSTICAL CEILING: Acoustical units for ceilings shall be of the noncombustible type and the design to match existing. Size, color, thickness, materials and method of installation shall also match existing. Following

installation, dirty or discolored surfaces of acoustical units and/or support system shall be cleaned in accordance with the manufacturer's recommendations. Components that are damaged or improperly installed shall be removed and replaced as directed without additional cost to the Government. Existing acoustical unit surfaces shall be repaired and new units provided if required due to relocation of partition or other work accomplished under this contract.

16. INSULATION: Install roll insulation as specified hereinbefore and where/as shown on drawings. Insulation shall be stapled between the roof joist and in accordance with the manufacturer's instructions.

17. GYPSUM WALLBOARD: Gypsum wallboard shall be installed on all new wood framed walls and on the west masonry wall of both rooms. Vinyl covered gypsum board and accessories for west masonry wall shall be "Government Furnished" and "Contractor Installed." All other gypsum board and appurtenances under this contract shall be furnished and installed by the Contractor, ready to receive painting. Wallboard shall be paint grade and shall be installed with adjoinments and joints occurring at solid wood bearings. Additional blocking or wood bearing will be provided for this purpose, if required. Nailing, taping and spackling shall be done in strict accordance with the manufacturer's recommendations. Interior corners shall be reinforced with tape as recommended by the manufacturer and exterior corners shall have a metal corner bead. Upon completion of installation and spackling has dried, the spackled areas shall be sanded as necessary to obtain a uniformly smooth surface, free from indentations, blemishes, and other detections when finish painted.

18. WATERPROOFING: Three ply membrane waterproofing shall be installed under new concrete floor slab. Materials shall conform to requirements specified hereinbefore. The first layer of felt shall be laid dry on the earth, the seams hot mopped with pitch, and two additional plies mopped in by the shingle method with each strip lapped over the preceding strip by 19 inches for 36-inch wide material, or 17 inches for 32-inch wide material, using not less than 30 pounds of pitch per 100 square feet, after which, the entire top surface shall be given a final mopping, using not less than 70 pounds of pitch per 100 square feet. Asphalt and asphalt felt or coaltar and coaltar felt may be used. Felt shall be applied free from wrinkles or buckles and the entire job rendered waterproof.

19. ROOFING: Five ply gravel surfaced built-up roofing shall be installed over new roof deck. Materials shall conform to requirements specified hereinbefore. Prior to installation, the entire roof deck including cants and other work shall be completed and left free from moisture, dirt, projections, and foreign materials. The built-up roofing shall consist of a layer of 30-pound felt tin tagged, then bitumen flooded, and followed with 4 layers successively mopped thereon in accordance with table I. Asphalt and asphalt felt or coaltar and coaltar felt may be used. Felt shall be applied free from wrinkles or bubbles. Each layer of felt shall be carried to the top

of the cant strip. At eave 2 layers of felt shall be applied beneath the first layer with not less than 9 inch mopping on and turned back 9 inches and mopped over the top roof ply. The gravel stop shall then be imbedded in bituminous cement and nailed on top of the envelope formed by the felt turnback. Metal base flashing shown to be tied into existing gravel stop after roofing application and installation of flashing, shall be stripped with 2 layers of felt 9 and 12 inches wide successively mopped on top of the roof flange. Plastic base flashing shown to be installed at existing wall to new roof juncture shall be flashed to match existing using mineral surfaced roofing, and shall consist of four layers of asphalt-saturated felt and one layer of mineral surfaced roofing cemented together with bituminous cement. Masonry or concrete over which flashing is to be installed shall be primed with asphalt primer which shall be allowed to dry thoroughly. The layers of saturated felt and the mineral-surfaced roofing shall be evenly embedded in bituminous cement applied with a trowel, using not less than 50 pounds per square per layer. The first layer of felt shall extend out onto the roofing at least 2 inches, and each succeeding layer shall extend at least 2 inches beyond the preceding layer. All layers shall extend up the vertical surface as shown, and shall be secured at the top on 8-inch centers with nails. Saturated-felt flashing sheets shall be approximately 5 feet in length and shall be lapped not less than 6 inches with laps staggered in each layer. Mineral-surfaced roofing strips shall be cut from the width of the material, and the strips shall be of sufficient length to extend from the sheet-metal reglet or curb onto the roof at least 2 inches beyond the widest flashing sheet. Mineral-surfaced strips shall be installed with selvage edges at right angles to the cant. Selvage laps shall be well cemented, and where possible, shall be shingled in a direction away from the prevailing wind. Asphalt bitumen shall be applied at the rate of 100 pounds per square for the five moppings of roofing felt and 60 pounds per square for the flood coat. Surfacing materials may be gravel, slag or marble chats applied at the rate of 350 pounds minimum per square.

Table I

LAPS FOR ROOFING FELTS (a)

Layers or plies	Laps in inches for 36-inch felt	Starting widths in inches for 36-inch felt
1	6	36
2	19	18 and 36
3	24-2/3	12, 24, and 36
4	27-1/2	9, 18, 27, and 36

(a) End laps of roofing felts shall be 6 inches and staggered.

20. SHEETMETAL WORK: Sheetmetal work shall include downspouts and gutter, flashing where required to be metal, and gravel stop. Downspouts and gutter shall be formed from .032 inch aluminum and shall be installed where shown on drawings. Gutters shall be attached to eaves with spikes and ferrules spaced not greater than 48 inches on centers. Downspout under "base bid" shall receive a splashblock of the type shown on sketch drawing appended to these specifications. Downspouts for "additive alternate" shall have the boot turned to splash on existing pavement. Gutters shall be installed with a slight pitch towards the downspout. Gravel stop and metal flashings shall be formed from .050 inch aluminum, and shop fabricated of one-piece material. Metal flashing for roof tie-in under existing gravel stop occurring on east wall shall be a continuous and unbroken length. If necessary, welding or soldering shall be done to achieve this result. Base flashing for mechanical roof vent shall be installed as shown on drawing, under the existing roofing at the base and thoroughly mastic sealed continuous.

21. PAINTING AND CALKING: Calking shall be polysulphide sealant gum type and shall be applied to thoroughly cleaned and bondable surfaces. Calking shall be done where/as shown on drawings including all exterior window, door, air conditioner, wood/masonry closures, and any other places which may be susceptible to entry of moisture or water. Calking shall be applied by skilled men in a uniform and neat manner and shall completely close the affected points or areas being calked. Painting shall consist of all new interior and exterior surfaces (excluding non-ferrous metal surfaces, acoustical ceiling, and vinyl covered gypsum wallboard) including previously painted existing exterior walls which will become interior walls due to this contract. The surfaces to be painted, type of paint, and number of coats shall be as specified hereinbefore and as described below. Colors of all paint shall be as selected by the Contracting Officer. All surfaces to receive paint shall be clean, smooth, dry and free from dust, scale or grit prior to painting. All work shall be done in a workmanlike manner, leaving the finished surfaces free from drops, ridges, waves, laps, and brush marks. Where applicable, floors and other adjacent work shall be properly protected by drop cloths or other coverings.

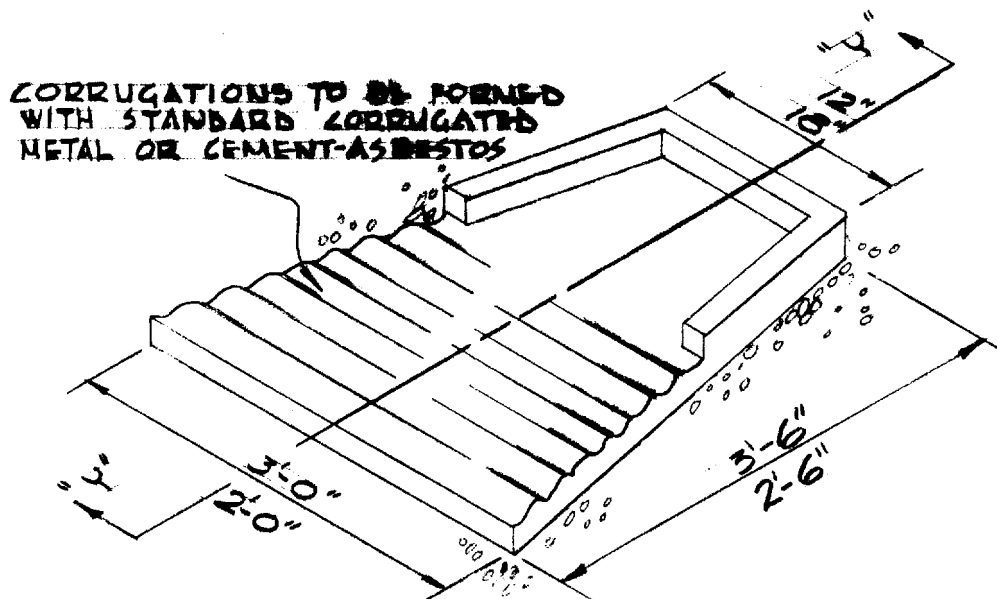
21.1 Exterior masonry and concrete--clean surface and apply 2 coats paint.

21.2 Interior masonry, concrete and gypsum wallboard--clean surface and apply 2 coats paint.

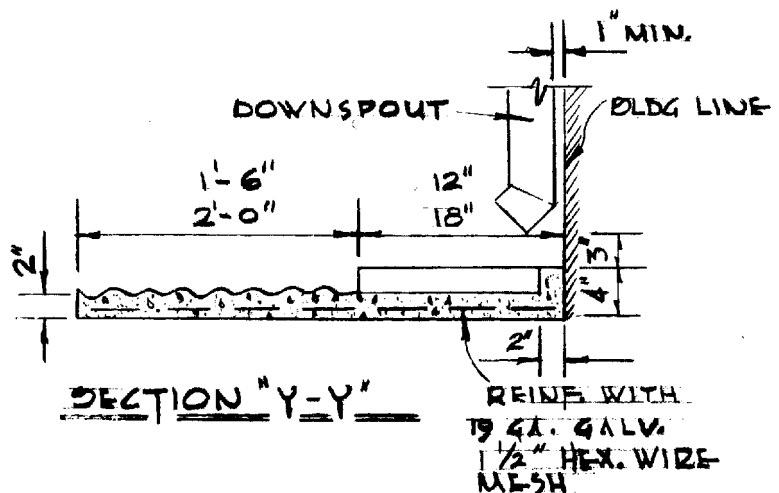
21.3 Exterior wood and metal--clean surface, apply 1 coat primer on wood followed with 2 coats finish paint on wood and metal.

21.4 Interior wood and metal trim, and doors--clean surface and apply 2 coats paint.

22. CLEANUP: Upon completion of work, all containers, scaffolding, lumber waste, or other debris shall be removed and the entire job left clean and acceptable to the Contracting Officer.



SKETCH-CONCRETE SPLASH BLOCK



NOTE:

1. USE 1'-0" x 2'-0" x 2'-6" SPLASH BLOCK FOR DOWNSPOUTS OF 16" IN SECTION AND SMALLER.
2. USE 1'-6" x 3'-0" x 3'-6" SPLASH BLOCK FOR DOWNSPOUTS OVER 16" AND WHERE EXCESSIVELY ERODIVE TYPE SOILS EXIST.

Approved For Release 1999/09/01 : CIA-RDP78-05732A000100010002-2

PLATE A-1 20 JAN, 1958

SPLASH BLOCK
DETAIL

25X1A6a

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SECTION 3

AIR CONDITIONING

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SECTION 3

AIR CONDITIONING

1. GENERAL: The contract drawings indicate the extent and general arrangement of the air-conditioning system. Equipment, ductwork, and piping arrangements shall fit into space allotted and shall allow adequate acceptable clearances for installation, replacement, entry, servicing, and maintenance.

1.1 Capacities of all equipment and material shall be not less than those indicated.

1.2 Conformance with agency requirements: Where materials or equipment are specified to conform to requirements of the Underwriters' Laboratories, Inc., Air-Conditioning and Refrigeration Institute, American Society of Heating, Refrigerating and Air-Conditioning Engineers, or the Air Moving and Conditioning Association, Inc., the Contractor shall submit proof of such conformance. The label or listing of the specified agency will be acceptable evidence. In lieu of the label or listing, the Contractor may submit a written certificate from any approved, nationally recognized testing organization adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements, including methods of testing, of the specified agency. Where equipment is specified to conform to requirements of the ASME Boiler and Pressure Vessel Code, the design, fabrication, and installation shall conform to the code in every respect. Installation of the system shall conform to the requirements of the National Fire Protection Association, Standard No. 90A.

1.3 Nameplates: Each major item of equipment shall have the manufacturer's name, address, serial and model numbers on a plate securely attached to the item.

1.4 Safety requirements: Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded.

1.5 Verification of dimensions: The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the Contracting Officer of any discrepancy before performing any work.

2. APPLICABLE PUBLICATIONS: The following publications of the issues listed below form a part of this specification and, where referred to thereafter by basic designation only, are applicable to the extent indicated by the references thereto:

2.1 Military Specifications:

MIL-A-3316B Adhesives, Fire-Resistant, Thermal Insulation.
& Am-2

2.2 American Society for Testing and Materials:

E 84-68 Surface Burning Characteristics of Building
Materials.

2.3 National Fire Protection Association:

No. 90A-1968 Air Conditioning and Ventilating Systems.
(In Vol. 4)

3. SHOP DRAWINGS: The Contractor shall submit complete descriptive data as the Contracting Officer may require to demonstrate compliance with the contract documents. Data shall be submitted to the Area Engineer for the following items:

Air Conditioner
Register
Outside Air Intake
Insulation and Adhesive

4. ELECTRICAL WORK: Electrical-motor-driven equipment specified herein shall be provided complete with motors, motor starters, and controls. Electric equipment and wiring shall be in accordance with SECTION: ELECTRICAL WORK. Electrical characteristics shall be as indicated.

5. AIR CONDITIONER: The Contractor shall provide one room-type air conditioner with electric strip heat of the size and capacity shown on the drawings. The electrical characteristics shall be as shown. If the Contractor chooses to provide additional equipment, it shall be provided at no additional cost to the Government. The air conditioner shall be tested and rated in accordance with NEMA Standard for the requirements of the Association of Home Appliance Manufacturers and shall be Underwriters' Laboratories, Inc., approved.

5.1 Cabinet: The cabinet shall be hot dipped galvanized steel with baked enamel finish. The size of the openings shall be cut to suit the unit furnished. The units shall have decorative front return air grilles made of molded, high heat, high impact, plastic finish. The discharge air door shall have directional air vanes for additional air distribution control. Insulation shall provide sound absorption and shall prevent sweating.

5.2 Filter: The filters shall be sized to suit the equipment furnished.

5.3 Controls: Fan-off-cool-heat switch with high and low speed fan operation shall be mounted in the unit. Thermostat shall be mounted in the unit with easily accessible adjustment setting knob. Thermostat setting range shall be approximately 65 to 85° F. All other controls, including motor starter and safety controls, shall be accomplished at the factory.

6. DUCTWORK:

6.1 General: Ductwork shall be constructed of galvanized iron, galvanized-steel sheets, or aluminum sheets. Unless otherwise approved, ducts shall conform accurately to the dimensions indicated, and shall be straight and smooth on the inside, with joints neatly finished. Ducts shall be anchored securely to the building and shall be so constructed and installed as to be completely free from vibration under all conditions of operation. Curved elbows shall have a centerline radius not less than 1-1/2 times the width of the duct. Joints shall be made substantially airtight, and no dust marks from air leaks shall show at duct joints or connections to grilles, registers, and diffusers. Laps shall be made in the direction of airflow. Edges and slips shall be hammered down to leave a smooth interior-duct finish. Button or bolt connections in standing seams shall be spaced at fixed centers not greater than 6-inch spacing. Transformations shall be made with a slope ratio of 5:1 minimum and 7:1 where practicable, or in a specifically approved manner. Square elbows shall be provided with double wall turning vanes. Unless otherwise specified, the sheet-metal ducts and stiffeners shall conform to table 1 hereinafter. Duct construction, hangers, and anchors shall comply with details outlined in ASHRAE or Sheet Metal and Air Conditioning Contractors' National Association, unless otherwise shown.

Table 1

Sheet-metal Gages for Rectangular-duct Construction

Thickness, inch (gage)		Maximum side inches	Type transverse joint connections	Bracing
<u>Aluminum</u>	<u>Galv. steel</u>			
0.0201 (24)	0.0217 (26)	Up through 12	S, drive, pocket, or bar slips on 7-ft. 10-in. centers	None

6.2 Dampers shall be provided as shown. Balancing dampers shall be provided with locking type quadrants.

6.3 Air extractors shall be factory fabricated or field assembled units consisting of adjustable curved turning vanes or louver blades. Inaccessible extractors shall be provided with means for adjustment and position lock external to the duct.

7. OUTSIDE AIR INTAKE shall be as shown, of 18-gage aluminum with aluminum bird screen. It shall be attached to the curb with log screws. The installation shall be watertight.

8. REGISTERS:

8.1 General: Registers shall be factory-fabricated aluminum and shall distribute the quantity of air specified evenly over space intended without causing noticeable drafts over 50 f.p.m. in occupied zone, or dead spots anywhere in the conditioned area. The Contractor shall be responsible for diffusion, spread, drop, and throw. If, according to the certified data of the manufacturer of the proposed units, the sizes indicated will not perform satisfactorily, the units shall be reselected to perform quietly and effectively in accordance with the manufacturer's recommendations as approved by the Contracting Officer. Registers shall be provided with volume control and accessible operator. After the system is in operation, if excessive noise, drafts, or dead spots, are noticeable in the conditioned spaces due to improper selection of type and size of diffuser, grille, or register, the unit shall be changed to the proper size and type without additional cost to the Government.

8.2 Registers shall be four-way directional-control type except that return and exhaust registers may be fixed pattern of design similar to supply-register face. Each register shall be provided with a face-operated opposed-blade volume-control damper. Registers shall be provided with sponge-rubber gasket between flange and wall or ceiling. Wall-supply registers shall be installed at least 6 inches below the ceiling. Free area of all registers shall be not less than 75 percent of face area.

9. DRAIN PIPING shall be of standard weight galvanized steel pipe with galvanized malleable iron threaded fittings or of material equal to that for existing drain lines. Lines shall be securely attached. Attachment shall maintain the waterproof integrity of the building.

10. INSULATION:

10.1 Insulation is not required for outside air ducts.

10.2 Acoustical duct lining:

10.2.1 General: Acoustical duct lining shall be fibrous glass designed exclusively for lining duct. For service in low-velocity duct systems, the air-side surface of the liner shall be capable of withstanding air velocity

of 4,000 feet per minute without delamination or erosion. Sound absorption coefficient shall be not less than indicated below as determined by procedures of the Acoustical Materials Association, mounting No. 6:

OCTAVE PASS BANDS	2	3	4	5	6	7
Mid-frequency, Cycles Per Second	125	250	500	1000	2000	4000
Sound Absorption Coefficient	.25	.48	.67	.88	.89	.79

The material shall be 1 inch thick, and the density of the insulation including any surface coating or facing shall not be less than 1.35 pounds per cubic foot nor greater than 3.3 pounds per cubic foot. The liner composition may be uniform density, graduated density or dual density, coated or uncoated, standard with the manufacturer. The acoustical liner shall conform to the fire-hazard classification requirement specified below. Duct sizes shown on the drawings shall be increased to compensate for the thickness of the lining used. Acoustical liner shall be provided where indicated on the drawings, and to the extent shown.

10.2.2 Fire hazard classification:

10.2.3 Insulating and acoustical materials, vapor barrier, covering and wrapping materials permanently attached or installed separately: Flame spread rating shall not exceed 25, and smoke developed rating shall not exceed 50, when tested in accordance with ASTM Specification E 84.

10.2.4 Adhesive for insulating materials, acoustical materials, vapor barrier, covering and wrapping materials:

10.2.4.1 Factory applied: Insulation, acoustical materials, vapor barrier, covering and wrapping materials that are factory applied with adhesive shall be tested as assembled, in accordance with ASTM Specification E 84 for pipe, duct, and equipment insulation and materials.

10.2.4.2 Field applied: When insulation, acoustical materials, vapor barrier, covering or wrapping materials are field applied, the adhesive shall be fire resistant in accordance with Military Specification MIL-A-3316, class 2.

10.2.5 Application: The lining shall be applied in strict accordance with the recommendations of the manufacturer of the lining.

11. TESTING:

11.1 Piping: Piping shall be visually inspected for leaks.

11.2 Ductwork: Ducts, plenums, and casings shall be tested and made substantially airtight at static pressure indicated for the system before covering

with insulation or concealing in masonry. Substantially airtight shall be construed to mean that no air leakage is noticeable through the senses of feeling or hearing.

11.3 Balancing:

11.3.1 Duct systems shall be balanced to produce air quantities within 5 percent of that indicated.

11.4 Performance tests: After cleaning, balancing, and testing operations have been completed, as hereinbefore specified, the system shall be tested as a whole to see that all items perform as an integral part of the system, and that temperatures and conditions are evenly controlled throughout the building. Corrections and adjustments shall be made as necessary to produce the conditions indicated.

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SECTION 4

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SECTION 4

ELECTRICAL WORK

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1.1 Federal Specifications:

J-C-30 & Int. Am-1	Cable and Wire, Electrical (Power, Fixed Installation).
W-C-375a & Am-3	Circuit Breaker, Molded Case; Branch-Circuit and Service.
W-P-115a & Am-2	Panel, Power Distribution.
W-S-865c & Am-1	Switch, Box, (Enclosed), Surface Mounted.
W-S-896c & Am-1	Switch, Toggle.
WW-C-00540c	Conduit, Metal, Rigid; and Coupling, Elbow, and Nipple, Electrical Conduit: Aluminum.
WW-C-563	Conduit, Metal, Rigid; and Bend and Elbow, Electrical Conduit: Thin-Wall Type (EMT).
WW-C-581d & Am-3	Conduit, Metal, Rigid; and Coupling, Elbow, and Nipple, Electrical Conduit: Zinc-Coated.

1.2 National Fire Protection Association Publication:

No. 70 National Electrical Code (1968).

2. GENERAL:

2.1 Rules: The installation shall conform to the applicable rules of the National Electrical Code.

2.2 Coordination: The contract drawings indicate the extent and the general location and arrangement of equipment, conduit, and wiring. The Contractor shall study building plans and details so that the outlets and equipment will be properly located and readily accessible. Lighting fixtures, and outlets shall be located to avoid interference with mechanical or structural features.

3. MATERIALS AND EQUIPMENT shall conform to the respective publications and other requirements specified below. Other materials and equipment shall be as specified elsewhere herein and as shown on the drawings and shall be the products of manufacturers regularly engaged in the manufacture of such products.

3.1 Ballast, fluorescent lamp: High-power-factor type. In addition, ballasts for 40-watt and larger lamps shall be class P and shall be automatic-resetting type.

3.2 Cable, nonmetallic sheathed: Type NM or NMC, with ground conductor.

3.3 Circuit breakers: Fed. Spec. W-C-375.

3.4 Conductors, insulated: Fed. Spec. J-C-30.

3.5 Conduit:

3.5.1 Zinc-coated rigid steel conduit: Fed. Spec. WW-C-581.

3.5.2 Rigid aluminum conduit: Fed. Spec. WW-C-540.

3.6 Panelboards: Dead-front construction, Fed. Spec. W-P-115.

3.7 Switches:

3.7.1 Enclosed safety switches: Fed. Spec. W-S-865.

3.7.2 Toggle switches, single-unit type: Fed. Spec. W-S-896.

3.8 Tubing, electrical, zinc-coated metallic steel: Fed. Spec. WW-C-563.

4. APPROVAL OF MATERIALS AND EQUIPMENT will be based on the manufacturer's published data.

4.1 The label or listing of the Underwriters' Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this listing the Contractor shall submit a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements.

4.2 A manufacturer's statement indicating complete compliance with the applicable Federal Specification is acceptable.

5. SHOP DRAWINGS shall be submitted for equipment not completely identifiable by information submitted in the materials and equipment lists, in accordance with requirements contained in the SPECIAL PROVISIONS. Material fabricated or delivered to the site before the approved shop drawings have been returned to the Contractor shall be subject to rejection.

<u>Paragraph No.</u>	<u>Item</u>	<u>Submit to:</u> <u>Area Engineer</u>
11	Panelboard	X
12	Lighting Fixtures	X

6. WIRING METHODS:

6.1 General: Unless otherwise indicated, wiring shall consist of non-metallic-sheathed cables installed in areas as permitted by the National Electrical Code and of insulated conductors installed in rigid zinc-coated steel, rigid aluminum, or electrical metallic tubing in other areas.

6.2 Conduit and tubing systems shall be installed as indicated. Minimum size of raceways shall be 1/2 inch. Only rigid steel conduit shall be installed in concrete. Aluminum conduit may be used only where installed exposed. In wet locations, fittings used with aluminum conduit shall be of copper-free aluminum. Non-aluminum sleeves shall be used where aluminum conduit passes through concrete floors and firewalls. Electrical metallic tubing may be installed only within buildings.

6.2.1 Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings.

6.2.2 Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Crushed or deformed raceways shall not be installed.

7. BOXES AND SUPPORTS: Boxes shall be provided in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of the cast-metal hub type when installed exposed up to 7 feet above interior floors and walkways. Boxes in other locations shall be sheet steel except that aluminum boxes may be used with aluminum conduit. Each box shall have the volume required by the NFPA Publication No. 70, National Electrical Code for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall be not less than 4 inches except that smaller boxes may be installed as required by fixture configuration, as approved. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required.

7.1 Boxes for use with raceway systems shall not be less than 1-1/2 inches deep except where shallower boxes required by structural conditions are approved. Boxes for other than lighting-fixture outlets shall be not less than 4 inches square except that 4- by 2-inch boxes may be used where only one raceway enters the outlet.

8. DEVICE PLATES of the one-piece type shall be provided for all outlets and fittings to suit the devices installed. Plates shall be of steel with ivory baked-enamel finish.

9. RECEPTACLES shall be of the type shown on the drawings. Duplex convenience outlets shall have bodies of ivory phenolic compound.

10. WALL SWITCHES shall be of the totally enclosed tumbler type with bodies of phenolic compound. Handles shall be ivory. Wiring terminals shall be of the screw type or of the solderless pressure type having suitable conductor-release arrangement. Not more than one switch shall be installed in a single-gang position. Switches shall be rated 20-ampere, 120-volt, for use on alternating current only.

11. PANELBOARDS: Panelboards shall be circuit breaker equipped, type 1. Circuit-breaker interrupting capacities shall conform to Federal Specification W-C-375 unless otherwise indicated. Single-pole breakers shall be full module size; two poles shall not be installed in a single module. Plug-in type breakers are not acceptable. Wiring gutters on panelboards having through feeders shall be 5-inch minimum. Panelboards shall not exceed 78 inches in height and shall be so mounted that the height of the top operating handle will not exceed 6 feet 6 inches from the floor. Locks shall be keyed alike. Nameplates shall be as approved. Directories shall be typed to indicate load served by each circuit and mounted in holder behind protective covering.

12. LAMPS AND LIGHTING FIXTURES of types and sizes as indicated shall be furnished and installed complete.

12.1 Lamps of the proper type, wattage, and voltage rating shall be delivered to the project in the original cartons and installed in the fixtures just prior to the completion of the project.

12.1.1 Fluorescent lamps shall have standard cool-white color characteristics and shall be of a type that will not require starter switches. The 40-watt lamps shall be of the rapid-start type.

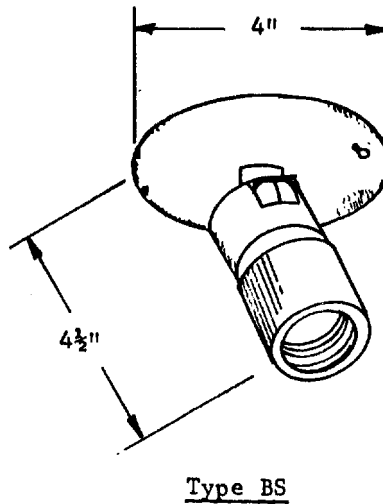
12.2 Fixtures shall conform to the following specifications and shall be as detailed on drawing No. 40-06-04, sheets Nos. 4 and 55, which accompany and form a part of this specification. Illustrations shown on these sheets are indicative of the general type desired and are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent light-distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved by the Contracting Officer.

12.3 Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation.

13. PAINTING AND FINISHING: Field-applied paint on exposed surfaces shall be provided under SECTION: PAINTING, GENERAL.

14. REPAIR OF EXISTING WORK: The work shall be carefully laid out in advance, and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved, at no additional cost to the Government.

15. TESTS: After the interior-wiring-system installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of this specification. The test shall be performed in the presence of the Contracting Officer or an authorized representative. The Contractor shall furnish all instruments and personnel required for the tests, and the Government will furnish the necessary electric power.



Medium base porcelain keyless socket attached to metal hood with ball socket and tension spring mounted on steel outlet box plate. Socket to be wired with heat resisting asbestos covered wire, No. 16 Awg. minimum, and shall take up to a 300 watt R-40 lamp.

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15 August 1950

Dwg. No. 40-06-04
Sheet 4

POLYSTYRENE TYPE12" - WIDE - 24"

SF-11 SF-12

PF-11 PF-12

MOUNTING

Surface

Pendant

ACRYLIC TYPE12" - WIDE - 24"

SF-21 SF-22

PF-21 PF-22

Suffix "S" Denotes Solid Metal Sides.

Fluorescent lighting fixture suitable for surface or pendant mounting as an individual or continuous row installation. Fixtures shall utilize 2 or 3 lamps in the 12 inch wide housing and 2, 3 or 4 lamps in the 24 inch wide housing. All lamps shall be 40-watt rapid start and the number of lamps per fixture shall be as indicated on the contract drawings. Fixture housing shall be 4 feet in length and 3-1/2 inches minimum and 4-1/2 inches maximum in depth, and shall be constructed of cold rolled steel with a solid top unless otherwise indicated. Thickness of steel shall be not less than .0359 inches nominal and shall be braced for maximum rigidity. Seams shall be welded and constructed to prevent light leakage. Frames and socket plates shall be of steel having a thickness of not less than .0478 inches nominal. Door frames shall be of precision fit or gasketed to prevent light leakage, may be hinged from either side, shall easily be removed without the use of tools, and shall be held in the closed position without external projections. The reflector shall be of steel having a thickness of not less than .0239 inches nominal, completely enclosing the ballasts and wiring, extending the full length of the fixture and forming a wireway for circuits through the fixture. Reflector shall be securely connected to the fixture body, but shall easily be removed for access to the ballasts and wiring without the use of tools. The shield and side panels shall be securely held in place in the door frame and housing, respectively, but shall easily be removed without the use of tools other than a screwdriver. All metal parts shall be coated with a rust inhibitor after fabrication and prior to the finish coat of baked white enamel. The finish coat shall have a reflectivity of not less than 86 percent.

All shields shall be flat, one piece plastic, 1/8 inch thick nominal. Polystyrene shields shall be clear, color stabilized, extruded or molded to a regular prismatic surface on the lower face and smooth on the upper face. Acrylic shields shall be clear, injection molded of 100 percent virgin acrylic, having a regular array of prismatic elements on the lower face and smooth on the upper face. Percentage of total lamp lumen output shall be at least 58 for the one foot wide fixture and 60.5 for the two foot wide fixture at 0-90 degrees when the fixture is surface mounted and has plastic side panels. The average brightness in foot-lamberts for acrylic shields using 3100 lumen lamps, two in the 12 inch wide fixture and four in the 24 inch wide fixture, shall not exceed 670 across the axes and 650 along the axes and 510 across the axes and 480 along the axes, respectively, in the 60-90 degree zone. Side panels shall be of white translucent plastic having a thickness of not less than 1/8 inch nominal and a transmission factor of not more than 65 percent nor less than 50 percent. Color stabilized polystyrene panels shall be used with polystyrene shields and panels of 100 percent virgin acrylic shall be used with acrylic shields. Where so indicated by the suffix "S" after the type designation on the contract drawings, the side panels shall be omitted and the fixture housing shall form the solid metal sides.

Ballasts shall be of the high power factor, rapid start, multi-lamp type, ETL-CBM certified, or certified as equal by a recognized independent testing laboratory. Conductors shall be not smaller than No. 18 Awg. and shall have a minimum temperature rating of 90 degrees C.

January 1966

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Sheet 55